



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/817,164	03/27/2001	Brian R. Stoner	032566-010	8176

7590

10/29/2002

Ronald L. Grudziecki  
BURNS, DOANE, SWECKER & MATHIS, L.L.P.  
P.O. Box 1404  
Alexandria, VA 22313-1404

EXAMINER

GUHARAY, KARABI

ART UNIT

PAPER NUMBER

2879

DATE MAILED: 10/29/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/817,164	STONER ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Karabi Guharay	2879	

-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-51 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 March 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____.  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>5</u> . | 6) <input type="checkbox"/> Other: .  |

Pre-amendment A, filed on July 18, 2001, and pre-amendment B, filed on August 9, 2002 have been entered.

### ***Information Disclosure Statement***

Information disclosure statement (Paper # 5) contains listing of following US applications: 09/259307, 09/376457, 09/594844. These are all being patented. According to 37 C.F.R. 1.98(b) applicant should list the patents in IDS instead of application. See MPEP 609, pages (600-120) A1.

### ***Specification***

The disclosure is objected to because of the following informalities: On page 7, line 11 "carbon nanotube" is repeated twice. Appropriate correction is required.

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: limitations of interface device box and central switching gear in claim 34 and 36.

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the elements "interface device box" and "central office switching gear" as claimed in claim 34, and 36, and "asymmetric digital subscriber line" as claimed in claim 37, as well as "high bit rate digital subscriber line" claimed in claim 38, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Art Unit: 2879

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 5-7, 14-15, 18-20, 25-26, 39, 41-42, 46-48 are rejected under 35 U.S.C. 102(b) as being anticipated by Gartner et al. (US 5866975).

Regarding claim 1, Gartner discloses an electrode (see Fig 2) comprising a first electrode (22), an adhesion-promoting layer (24) disposed on at least one surface of the first electrode (22), and a nano-structure containing material (26) disposed on a portion of the adhesion promoting layer (22). See lines 66 of column 5-17 of column 6.

Regarding claim 2, Gartner discloses that the electrode is a gas discharge device electrode (see abstract).

Regarding claims 5 and 7, Gartner discloses that the adhesion promotion layer (24) comprises a metallic material such as Ni, Co, Fe, Si, Mo, Ti, Ta, W, Nb, Zr, Cr, Hf, Al, Sn Cd, Zn, or Bi (lines 3-7 of column 6).

Regarding claim 6, Gartner discloses that the adhesion promotion layer (24) comprises a carbon-dissolving, carbide forming, or low melting point material (tungsten is a carbide forming material, tungsten carbide).

Regarding claims 14, 25 and 49, Gartner discloses that the nano-structure material covers the entire adhesion promotion layer (24, see Fig 2).

Regarding claims 15, 26, 39, 42 and 48, Gartner discloses that the low pressure cathode comprising a first electrode material (22) and adhesion promoting layer (24) disposed on at least one surface of the first electrode material and a nano-structure containing material (26) disposed on at least a portion of the adhesion promoting layer (24) is used in a electric discharge tube or discharge lamp (see abstract), but does not disclose a sealed chamber containing at least one noble gas and a plurality of spaced electrodes, however, it is inherent in any electric discharge tube or discharge lamp.

Claim 18 recites essentially the same limitations of claim 5. Thus claim 18 is rejected as claim 5 (see rejection of claim 5).

Claims 19, 41 and 46, recite essentially the same limitations of claim 6. Thus claim 19 is rejected as claim 6 (see rejection of claim 6).

Claims 20, and 47 recite essentially the same limitations of claim 7. Thus claim 20 is rejected as claim 7 (see rejection of claim 7).

Claims 1, 5-8, 10-11, 22, 43 are rejected under 35 U.S.C. 102(b) as being anticipated by Hsu (US 6448701).

Regarding claim 1, Hsu discloses an electrode (see Fig 2) comprising a first electrode material (conductive substrate 102 of Fig 1f, or 302 of Fig 3b, line 12-13 of column 5) an adhesion-promoting layer (catalyst layer 104, and 304 of Fig 1f and 3b respectively) disposed on at least one surface of the first electrode (102), and a nano-

Art Unit: 2879

structure containing material (114 of Fig 1F, or 314 of Fig 3b, lines 7-9 of column 6) disposed on a portion of the adhesion promoting layer (104, or 304).

Regarding claims 5-7, Hsu discloses that the adhesion-promoting layer (104) comprises metallic material, tungsten, which is a carbide forming material.

Regarding claim 8, Hsu discloses that nano-structure containing material is a carbon nanotube.

Regarding claim 10, Hsu discloses that nano-structure containing material is formed from carbon or silicon or germanium (lines 15-20 of column 7).

Regarding claims 11, 22 and 43, Hsu disclosed that the electrode is annealed (line 62-64 of column 6).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-4, 9, 12-13 16-17, 21, 23-24, 40, 45, 50-51, are rejected under 35 U.S.C. 103(a) as being unpatentable over Gartner et al. (US 5866975).

Regarding claims 3, 16, and 51, Gartner meets all the limitations of claim 3, except for the first electrode material being molybdenum. However, Gartner discloses that the first material is conductive, molybdenum is a well known conductive material for making electrode, thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to use molybdenum as the first electrode material in

Art Unit: 2879

the device of Gartner, since selection of known material on the basis of its suitability for intended use is within the skill of a general worker in the art.

Regarding claims 4, 17 and 50, Gartner meets all the limitations of claims 4, and 17 together with nano-structure containing layer having thickness of approximately 1-100 micron (line 3 of column 4) as claimed in claims 17 and 50, but, fails to disclose the thickness of the adhesion-promoting layer (24). However, it would have been obvious to one having ordinary skill in art at the time of invention to obtain a range of thickness as 1-1000 nm, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Regarding claim 9, 21, 40, and 45, Gartner discloses different nano-structure material, instead of claimed single-wall-carbon nanotube. Single walled carbon nanotubes are well known suitable nano-structure in the field of electrode material, thus, thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to use single wall carbon nanotube as the first nano-structure material in the device of Gartner, since selection of known material on the basis of its suitability for intended use is within the skill of a general worker in the art.

Regarding claims 12-13, and 23-24, Gartner discloses that the low voltage cathode has turn on voltage for electron emission for greater than 3 microampere is about 7.5V/micron (see Fig 1 and lines 30-42 of column 7), however, it would have been obvious to one having ordinary skill in art at the time of invention to obtain a range of thickness as claimed in claim 12-13 and 23-24, since it has been held that where the

Art Unit: 2879

general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Claims 27-31 rejected under 35 U.S.C. 103(a) as being unpatentable over Yapoujin (US 4707762), and further in view of Gartner as applied to claim 1.

Regarding claims 27-29, Yapoujian discloses a gas discharge tube having spaced electrodes (20, 22 of Fig 2) having separation distance between 0.1-1.0 mm, where the separation distance is created by a ceramic spacer (30, lines 17-66 of column 3), but fails to disclose electrodes as claimed in claim 1. However, Gartner discloses an electrode as claimed in claim 1 in a gas discharge tube, since such tubes have short switching time as well as energy consumption for the tube is low (lines 37-41 of column 2). Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to use electrodes as disclosed by Gartner in the surge protection gas tube of Yapoujian used in telecommunication circuit, since this will improve the switching time of the protection device as well as cost of the device.

Regarding claims 30-31, Yapoujin discloses an inert gas but does not disclose pressure of 0.5-800 torr, and inert gas being argon. However, choosing argon as the inert gas and obtaining a optimum range of the pressure would have been obvious to an ordinary skill in the art, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Claims 32-33, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Debbaut et al. (US 5557250), and further in view of Gartner as applied to claim 1.



Art Unit: 2879

Regarding claims 32-33, Debbaut et al. discloses a telecommunication network comprising a gas discharge tube having all the limitations of claims 32-33 (lines 50-62 of column 14), including average breakdown voltage of approximately 448.5V or 400V (lines 5-6 of column 15) except for the electrodes as claimed in claim 1. However, Gartner discloses an electrode as claimed in claim 1 in a gas discharge tube (see rejection of claim 1), since such tubes have short switching time as well as low energy consumption (lines 37-41 of column 2). Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to use electrodes as disclosed by Gartner in the protection gas tube of Debbaut's telecommunication circuit, since this will improve the switching time of the protection device as well as cost of the device.

Claims 34 and 36 are rejected under 35 U.S.C 103 (a) as being unpatentable over Debbaut et al. (US 5557250), in view of Gartner further in view of Perry et al. (US 5557672).

Regarding claims 34, and 36, both Debbaut and Gartner meet all the limitations of claim 34 and 36, except for an interface unit and a central switching gear. However, Perry et al. discloses a telecommunication network with central switching gear for switching different channel and an interface unit for digitizing DC and AC signal carried by two-wire transmission path (lines 8-12 and 52-61 of column 4). Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate central switching gear in order to control telecommunication and an interface device for digitize DC and AC signal.

Art Unit: 2879

Claims 37 and 38 are rejected under 35 U.S.C 103 (a) as being unpatentable over Debbaut et al. (US 5557250), in view of Gartner further in view of Dunn et al. (US 5841836).

Regarding claim 37, and 38, Debbaut and Gartner meet all the limitations of the claims 37 and 38 except for ADSL and HDSL lines in the telecommunication network. However, Dunn et al. discloses a telecommunication network with ADSL and HDSL line in order to transfer data to customers. Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to include ADSL and HDSL line in the telecommunication system of Debbaut for transferring high-speed data to customers.

Claims 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hsu (US 6448701).

Regarding claim 44, Hsu discloses a step of annealing the coated electrode, while does not exemplify the duration pressure and temperature of annealing process. However, it would have been obvious to one having ordinary skill in the art to experiment and find out the optimum conditions for the controlled variable in the prior art process, since it is considered to be within the general skill of a worker.

#### ***Other Prior Art Cited***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure : Lee et al. (US 6339281).

Art Unit: 2879

**Contact Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karabi Guharay whose telephone number is (703) 305-1971. The examiner can normally be reached on Monday-Friday 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (703) 305-4794. The fax phone number for the organization is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

K.G

Karabi Guharay  
Patent Examiner  
Art Unit 2879

✓  
VIP FATEL  
PRIMARY EXAMINER